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(71) Applicant (for all designated States except US):  
**WORCESTER POLYTECHNIC INSTITUTE**  
[US/US]; 100 Institute Road, Worcester, MA 01609  
(US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DATTA, Ravindra**  
[US/US]; 3 Rutland Terrace, Worcester, MA 01609 (US).  
**ZHANG, Jingxin** [CN/US]; 34 Bowdoin Street, Worces-  
ter, MA 01609 (US).

(74) Agent: **PIERCE, N. Scott**; Hamilton, Brook, Smith &  
Reynolds, P.C., 530 Virginia Road, P.O. Box 9133, Con-  
cord, MA 01742-9133 (US).

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(57) Abstract: An electrochemical device comprises an electrochemical reactor that includes a single or multiple electrochemical cells and a galvanostat, a gas source and a fuel cell system. Each of the electrochemical cells includes an anode compartment and a cathode compartment. The gas source is in fluid communication with the anode or cathode compartment of each of the electrochemical cells, including at least two components that are selectively reactive relative to each other. The selectivity of the two components of the gas source is dependent upon an electrical potential between an anode of the anode compartment and a cathode of the cathode compartment, whereby a constant current between the anode and cathode causes the electrical potential to oscillate autonomously while the gas components are directed through the anode or cathode compartment. The oscillation in potential causes autonomous oscillation of selective reaction of the gas components.



**WO 2005/013403 A2**